BROOKHAVEN NATIONAL LABORATORY

Work Permit # DRL-2011-014
Work Order # _____
Job# _____ Activity# _____

1. Work requester fills out this section. ☐ **Standing Work Permit**

Requester: Don Lynch	Date: 6/29/2011	Ext.: 2253	Dept/Div/Group: PO/PHENIX
Other Contact person (if different from requester): Carter Biggs			Ext.: 7515
Work Control Coordinator: Don Lynch		Start Date6/29/2011	Est. End Date: 12/1/20110
Brief Description of Work: PC1 East FEM Repair			
Building: 1008	Room: IR	Equipment: PC1 East	Service Provider: PHENIX techs & PC experts

. WCC, Requester/Designee, Service Provider, and ES&H (as necessary) fill out this section or attach analysis

ES&H ANALYSIS				
Radiation Concerns ☒ None	☐ Activation	☐ Airborne	☐ Contamination	☐ Radiation
Radiation Generating Devices: ☐ Radiography	☐ Moisture Density Gauges	☐ Soil Density Gauges	☐ X-ray Equipment	
☐ Special nuclear materials involved, notify Isotope Special Materials Group			☐ Fissionable materials involved, notify Laboratory Criticality Officer	
Safety Concerns ☐ None	☐ Ergonomics	☐ Transport of Haz/Rad Material		
☐ Adding/Removing Walls or Roofs ☐ Confined Space*	☐ Explosives	☐ Lead*	☐ Penetrating Fire Walls	
☐ Corrosive	☐ Flammable	☐ Magnetic Field*	☐ Pressurized Systems	
☐ Asbestos* ☐ Cryogenic	☐ Fumes/Mist/Dust*	☐ Material Handling	☐ Rigging/Critical Lift	
☐ Beryllium* ☐ Electrical	☐ Heat/Cold Stress	☐ Noise*	☐ Toxic Materials*	
☐ Biohazard* ☒ Elevated Work*	☐ Hydraulic	☐ Non-ionizing Radiation*	☐ Vacuum	
☐ Chemicals* ☐ Excavation	☐ Lasers*	☐ Oxygen Deficiency*	☐ Other	
* Does this work require medical clearance or surveillance from the Occupational Medicine Clinic? ☐ Yes ☒ No				
Environmental Concerns ☒ None		☐ Work impacts Environmental Permit No.		
☐ Atmospheric Discharges (rad/non-rad)	☐ Land Use	☐ Soil Activation/contamination	☐ Waste-Mixed	
☐ Chemical or Rad Material Storage or Use	☐ Liquid Discharges	☐ Waste-Clean	☐ Waste-Radioactive	
☐ Cesspools (UIC)	☐ Oil/PCB Management	☐ Waste-Hazardous	☐ Waste-Regulated Medical	
☐ High water/power consumption	☐ Spill potential	☐ Waste-Industrial	☐ Underground Duct/Piping	
Waste disposition by:			☐ Other	
Pollution Prevention (P2)/Waste Minimization Opportunity: ☒ None ☐ Yes				
FACILITY CONCERNS ☒ None				
☐ Access/Egress Limitations ☐ Electrical Noise	☐ Potential to Cause a False Alarm		☐ Vibrations	
☐ Impacts Facility Use Agreement		☐ Temperature Change	☐ Other	
☐ Configuration Control ☐ Maintenance Work on Ventilation Systems		☐ Utility Interruptions		
WORK CONTROLS				
Work Practices				
☐ None ☐ Exhaust Ventilation	☒ Lockout/Tagout	☐ Spill Containment	☐ Security (see Instruction Sheet)	
☒ Back-up Person/Watch ☐ HP Coverage	☐ Posting/Warning Signs	☐ Time Limitation	☐ Other	
☐ Barricades ☐ IH Survey	☐ Scaffolding-requires inspection	☐ Warning Alarm (i.e. "high level")		
Protective Equipment				
☐ None ☐ Ear Plugs	☐ Gloves	☐ Lab Coat	☒ Safety Glasses	
☐ Coveralls ☐ Ear Muffs	☐ Goggles	☐ Respirator	☐ Safety Harness	
☐ Disposable Clothing ☐ Face Shield	☐ Hard Hat	☐ Shoe Covers	☒ Safety Shoes	☐ Other
Permits Required (Permits must be valid when job is scheduled.)				
☒ None ☐ Cutting/Welding	☐ Impair Fire Protection Systems			
☐ Concrete/Masonry Penetration ☐ Digging/Core Drilling	☐ Rad Work Permit-RWP No			
☐ Confined Space Entry ☐ Electrical Working Hot	☐ Other			
Dosimetry/Monitoring				
☒ None ☐ Heat Stress Monitor	☐ Real Time Monitor	☐ TLD		
☐ Air Effluent ☐ Noise Survey/Dosimeter	☐ Self-reading Pencil Dosimeter	☐ Waste Characterization		
☐ Ground Water ☐ O_2/Combustible Gas	☐ Self-reading Digital Dosimeter	☐ Other Check O2 level prior to entry		
☐ Liquid Effluent ☐ Passive Vapor Monitor	☐ Sorbent Tube/Filter Pump			
Training Requirements (List below specific training requirements)				
CA –Collider User, PHENIX Awareness				

Based on analysis above, the Walkdown Team determines the risk, complexity, and coordination ratings below:		**If using the permit when all hazard ratings are low, only the following need to sign: (Although allowed, there is no need to use back of form)**	
ES&H Risk Level:	☒ Low ☐ Moderate ☐ High	WCC:	Date:
Complexity Level:	☒ Low ☐ Moderate ☐ High	Service Provider:	Date:
Work Coordination:	☒ Low ☐ Moderate ☐ High	Authorization to start	Date:
		(Departmental Sup/WCC/Designee)	

3. Both work requester and service provider contribute to work plan (use attachments for detailed plans)

Work Plan (procedures, timing, equipment, and personnel availability need to be addressed): See Attached Work Plan
Special Working Conditions Required: None
Operational Limits Imposed: Modification work limited to lower octants easily reachable when standing on lower magnet superstructure.
Post Work Testing Required: No

Job Safety Analysis Required: ☐ Yes ☒ No	Walkdown Required: ☒ Yes ☐ No

Reviewed by: Primary Reviewer will determine the size of the review team and the other signatures required based on hazards and job complexity. Primary Reviewer signature means that the hazards and risks that could impact ES&H have been identified and will be controlled according to BNL requirements.

Title	Name (print)	Signature	Life #	Date
Primary Reviewer				
ES&H Professional				
Other				
Other				
Work Control Coordinator				
Service Provider				
	Review Done: ☐ in series	☐ team		

4. Job site personnel fill out this section.

Note: Signature indicates personnel performing work have read and understand the hazards and permit requirements (including any attachments).			
Job Supervisor:		Contractor Supervisor:	
Workers:	Life#:	Workers :	Life#:
Workers are encouraged to provide feedback on ES&H concerns or on ideas for improved job work flow. Use feedback form or space below.			

5. Departmental Job Supervisor, Work Control Coordinator/Designee

Conditions are appropriate to start work: (Permit has been reviewed, work controls are in place and site is ready for job.)			
Name:	Signature:	Life#:	Date:

6. Departmental Job Supervisor, Work Requester/Designee determines if Post Job Review is required. ☐ Yes ☐ No

Post Job Review (Fill in names of reviewers)			
Name:	Signature:	Life#:	Date:
Name:	Signature:	Life#:	Date:

7. Worker provides feedback.

Worker Feedback (use attached sheets as necessary)
a) WCM/WCC: Is any feedback required? ☐ Yes ☐ No

b) Workers: Are there better methods or safer ways to perform this job in the future? ☐ Yes ☐ No

8. Closeout: Work Control Coordinator (authorizing dept.) checks quality of completed permit and ensures the work site is left in an acceptable condition. (WCC can delegate clean up of work area to work supervisor)

Name:	Signature:	Life#:	Date:
Comments:			

Attachment to W.P. #DRL-2011-014 **June 29, 2011**

PC1E Toubleshooting in the PHENIX Experimental Hall (bldg. 1008).

Problem

A malfunctioning front end module (FEM) in the PHENIX east Pad Chamber 1 at the bottom end is not functioning properly. (see figure 1) The faults can be addressed by troubleshooting the offending FEM board and connectors which are accessible by arranging to get at it from a step ladder or fixed ladder. The DC/PC1 module may need to be opened a few inches to access the faulty components.

The procedures described below have been used successfully in the past to trouble shoot and repair similarly malfunctioning components of the PC1 detector subsystem. The procedure involves use of a fixed ladder secured to the body of the CM.

Work Plan

This work is to be done by fully trained and experienced personnel (PHENIX mechanical and electrical technicians and PC1 expert scientists) during the 2011 maintenance shutdown.

REF: PP-2.5.5.1-01 "Moving the Central Magnet and Detector Carriages in the PHENIX IR"

1. Preparation for repairs

- persons performing this work shall have PHENIX Awareness training, CA access training and BNL ladder training.

- Move the east carriage to its open (east-most) position and secure it at the position in accordance with PHENIX standard operating procedures (PP-2.5.5.1-01).

- Ensure that power to the DC & PC1 electronics are secured and that the CM power key is locked out of use.

- A watch person must be present at all times when a person is on the ladders

- Test, reseat, reset, etc. the connection between the faulty module and its cables as necessary to determine the cause of malfunctioning.

- Effect appropriate repairs as necessary. If repairs exceed simple remove/replace, reseat or reset efforts (see PHENIX Awareness Training) such that additional planning is

required, restore all equipment to pre-troubleshooting configuration and consult with PHENIX work control coordinator(s) before attempting more complicated repair efforts.

2. Open the DC/PC1 East

Should access to the module/cable/connector prove to be impossible without moving the DC/PC1 east assembly, the assembly may be moved a few inches, up to 12 inches, as achievable without disconnecting any cables, wires hoses or tubing, except for rigid tubing or piping easily disconnected from the bottom end of the DC. This is accomplished as follows:

- remove rigid tubing or piping easily disconnected from the bottom end of the DC.

- install a C-clamp stop to prevent the DC/PC1 assembly from moving more than 3 inches west from its run position.

- remove the clamp securing the DC east in the run position.

- put the DC thrust bar into the retaining slot.

- carefully push the DC translation thrust bar westward to slowly move the DC/PC1 approximately 1-12 inches as allowed by cabling, hose and tubing slack. Take care not to damage any cables, hoses and/or tubes.

- install the open position retaining clamp

4. Work conclusion

- remove ladders

- remove the clamp securing the DC in the open position.

- carefully push the DC translation thrust bar eastward to slowly move the DC/PC1 a few inches until it contacts its run position stops.

-re-install the run position retaining clamp

- remove the east stop C-clamp

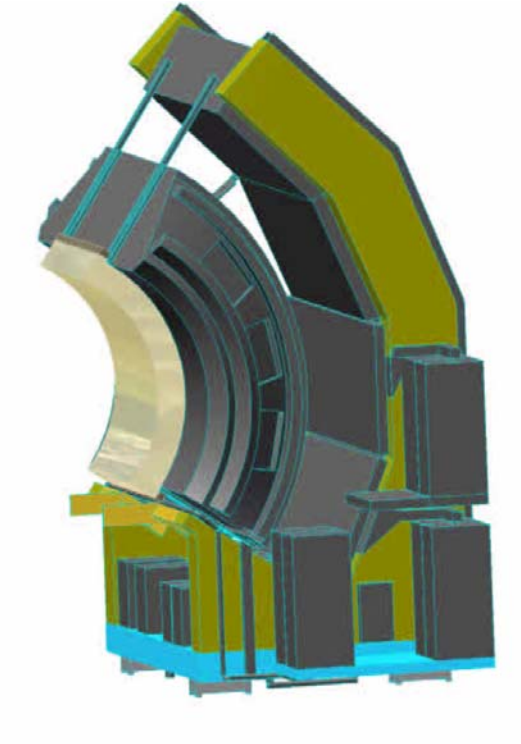
- remove the DC translation thrust bar from the thrust bar retaining slots and return it to storage for future use.

-check all wiring and piping to make sure none were damaged during the DC/PC1 moves. Effect repairs if necessary.

- re-install any rigid tubing/piping as necessary.

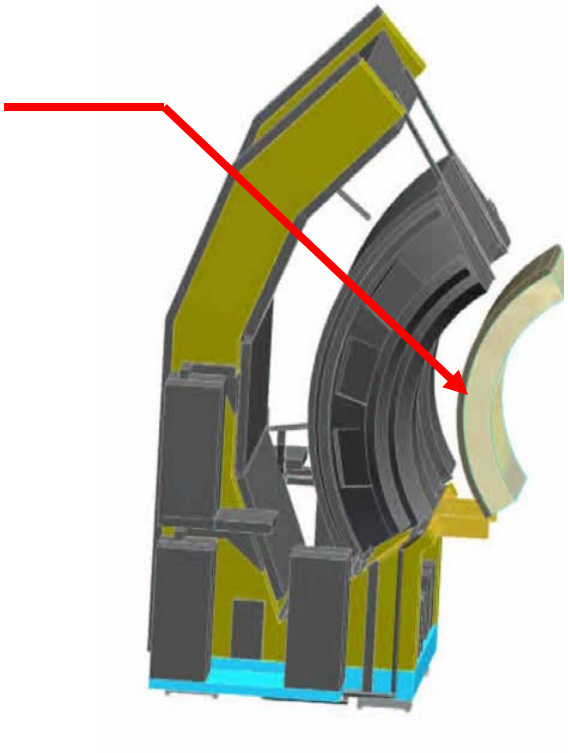
- Close out work permit recording any useful feedback concerning the work performed.

Figure 1: FEM repairs needed on PC1 West



East Carriage with
DC/PC1 in run position

Faulty
PC1EC2
Location



East Carriage with
DC/PC1 in open position

Figure 2: Drift Chamber Translation